

CONSOLIDATED RECOVERED MATERIALS ADVISORY NOTICE (RMAN) FOR THE COMPREHENSIVE PROCUREMENT GUIDELINE (CPG)

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**U.S. Environmental Protection Agency
Office Of Solid Waste**

CONSOLIDATED RECOVERED MATERIALS ADVISORY NOTICE (RMAN)

EPA's Comprehensive Procurement Guideline (CPG) designates recycled content products that government agencies should buy. EPA publishes purchasing guidance and recommendations for recycled content levels in Recovered Material Advisory Notices (RMANs) that accompany each CPG, and updates its guidance annually. For the convenience of procurement officials, this document represents a compilation of the five RMANs published by EPA to date. The *Federal Register* citations are as follows:

RMAN I:	60 FR 21386, May 1, 1995
Paper Products RMAN:	61 FR 26986, May 29, 1996
RMAN II:	62 FR 60995, November 13, 1997
Paper Products RMAN II:	63 FR 31214, June 8, 1998
RMAN III:	65 FR 3082, January 19, 2000
RMAN IV:	69 FR 24039, April 30, 2004

EPA has designated a total of 61 items in eight product categories, as follows:

Paper and Paper Products

Vehicular Products

- Re-refined Lubricating Oil
- Retread Tires
- Engine Coolants
- Rebuilt Vehicular Parts

Construction Products

- Building Insulation
- Structural Fiberboard
- Laminated Paperboard
- Cement and Concrete Containing Coal
 - Fly Ash, Ground Granulated
 - Blast Furnace Slag,
 - Cenospheres, or Silica Fume
- Polyester Carpet
- Floor Tiles and Patio Blocks
- Shower and Restroom
 - Dividers/Partitions
- Consolidated and Reprocessed Latex
 - Paint
- Carpet Cushion
- Flowable Fill
- Railroad Grade Crossing Surfaces
- Modular Threshold Ramps
- Nonpressure Pipe

Transportation Products

- Temporary Traffic Control Devices
- Parking Stops
- Channelizers
- Delineators
- Flexible Delineators

Park and Recreation Products

- Playground Surfaces and Running
 - Tracks
- Plastic Fencing
- Park Benches and Picnic Tables
- Playground Equipment

Landscaping Products

- Hydraulic Mulch
- Yard Trimmings Compost
- Garden and Soaker Hoses
- Lawn and Garden Edging
- Plastic Lumber Landscaping Timbers
 - and Posts
- Food Waste Compost

Non-Paper Office Products

- Office Recycling Containers
- Office Waste Receptacles
- Plastic Desktop Accessories
- Toner Cartridges
- Binders
- Plastic Trash Bags
- Printer Ribbons
- Plastic Envelopes
- Solid Plastic Binders
- Plastic Clipboards
- Plastic File Folders
- Plastic Clip Portfolios
- Plastic Presentation Folders
- Office Furniture

Miscellaneous Products

- Pallets
- Sorbents
- Industrial Drums
- Awards and Plaques
- Mats
- Manual-grade Strapping
- Signage
- Bike Racks
- Blasting Grit

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I. General Recommendations

Part A -- Definitions

As used in this Recovered Materials Advisory Notice:

Act or RCRA means the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, as amended, 42 U.S.C 6901 *et seq*;

Federal agency means any department, agency, or other instrumentality of the federal government; any independent agency or establishment of the federal government including any government corporation; and the Government Printing Office;

Person means an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, federal agency, State, municipality, commission, political subdivision of a State, or any interstate body;

Postconsumer material means a material or finished product that has served its intended use and has been diverted or recovered from waste destined for disposal, having completed its life as a consumer item. Postconsumer material is a part of the broader category of recovered materials;

Postconsumer recovered materials, for purposes of purchasing paper and paper products, is a subset of the broader term recovered materials, as defined in RCRA section 6002(h), and means:

- (1) Paper, paperboard, and fibrous wastes from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards and used cordage; and
- (2) All paper, paperboard, and fibrous wastes that enter and are collected from municipal solid waste;

Procuring agency means any federal agency, or any State agency or agency of a political subdivision of a State, which is using appropriated federal funds for such procurement, or any person contracting with any such agency with respect to work performed under such contract;

Recovered materials means waste materials and byproducts which have been recovered or diverted from solid waste, but such term does not include those materials and byproducts generated from, and commonly reused within, an original manufacturing process.

Part B -- Specifications

EPA recommends that federal agencies review and revise their product specifications with a view to eliminating unnecessary stringency as well as requirements which bear no relation to function in order to allow for the use of recovered materials. Specifications that bear no relation to function should be revised according to the agency's established specifications review procedures. EPA further recommends that, in reviewing an existing specification's provisions pertaining to function, federal agencies refer to existing voluntary standards and research by organizations such as the American

Society for Testing and Materials (ASTM), the American Association of State Highway and Transportation Officials (AASHTO), the Technical Association of the Pulp and Paper Industry (TAPPI), and the American Institute of Paper Chemistry.

Federal agencies that reference Commercial Item Descriptions (CIDs) or appropriate industry standards should continue to reference them when purchasing designated items. However, agencies should review or modify CIDs and industry standards, as appropriate, to be certain that the use of recovered materials is allowed.

Under RCRA section 6002, federal agencies need not revise specifications to allow or require the use of recovered materials if it can be determined that for technical reasons, for a particular end use, a product containing such materials will not meet reasonable performance standards. EPA recommends that federal agencies document such determinations and that the determination be based on technical performance information (including any product testing) pertaining to a specific item or application. EPA further recommends that federal agencies reference such documentation in the contract files for subsequent procurement of the specific item.

In most cases, for the items designated in the CPG, EPA has recovered materials content levels for specific types or grades of items or for certain applications. EPA notes, however, that the intent is not to preclude federal agencies from procuring other types or grades of items, or from using recovered materials content items for other applications. On the contrary, if a new type or grade of a designated item becomes available containing recovered materials or if a federal agency discovers a new application for which recovered materials content is appropriate, EPA encourages the agency to revise its specifications or develop new specifications to allow the use of recovered materials in that type or grade of item or that specific application.

Part C -- Affirmative Procurement Programs

EPA recommends that the Environmental Executive within each major procuring agency take the lead in developing the agency's affirmative procurement program and in implementing the recommendations set forth in this RMAN. The basic responsibilities of an Agency Environmental Executive are described in sections 302 and 402 of Executive Order 13101, "Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition," (63 FR 49643, September 14, 1998). In the absence of such an individual, EPA recommends that the head of the implementing agency appoint an individual who will be responsible for ensuring the agency's compliance with RCRA section 6002 and Executive Order 13101.

RCRA section 6002 and Executive Order 13101 require procuring agencies to establish affirmative procurement programs for each EPA-designated item. EPA recommends that each agency develop a single, comprehensive affirmative procurement program with a structure that allows for the integration of new items as they are designated. Consistent with Executive Order 13101, EPA encourages agencies to implement preference programs for nonguideline items as well, in order to maximize their purchases of recycled-content products and foster markets for recovered materials.

Preference Program: In Section II of this RMAN, EPA provides specific recommendations for procuring agencies to use when purchasing the EPA-designated items. For most of these items, EPA recommends that procuring agencies establish minimum-content standards based on EPA's recommended recovered materials content levels and the procuring agencies' own research. For other items, the use of minimum content standards is inappropriate, and procuring agencies should establish an alternative program, as recommended by EPA.

In addition, EPA recommends that procuring agencies review their procurement practices and eliminate those that would inhibit or preclude the use of an item containing recovered materials. Specific examples of such procurement practices are provided in the item-specific recommendations, where appropriate.

Promotion Program: EPA recommends that procuring agencies include both internal and external promotion in their affirmative procurement programs.

There are several methods that procuring agencies can use to educate their employees about their affirmative procurement programs. These methods include preparing and distributing agency affirmative procurement policies, publishing articles in agency newsletters and publications, including affirmative procurement program requirements in agency staff manuals, and conducting workshops and training sessions to educate employees about their responsibilities under agency affirmative procurement programs.

Methods for educating existing contractors and potential bidders regarding an agency's preference for purchasing products containing recovered materials include publishing articles in appropriate trade publications, participating in vendor shows and trade fairs, placing statements in solicitations, and discussing an agency's affirmative procurement program at bidders' conferences.

Monitoring: EPA recommends that procuring agencies monitor their affirmative procurement programs, in accordance with RCRA section 6002(I)(2)(D) and Executive Order 13101, to ensure that they are fulfilling their requirements to purchase items composed of recovered materials to the maximum extent practicable. EPA anticipates that the Federal Environmental Executive and the Office of Federal Procurement Policy will request information from Federal agencies on their affirmative procurement practices. Therefore, EPA recommends that Federal procuring agencies maintain adequate records of procurement that may be affected by the Executive Order and RCRA requirements.

EPA recommends that procuring agencies track their purchases of products containing recovered materials to establish benchmarks from which progress can be assessed. To maintain adequate records on procurement of products containing recovered materials, EPA recommends that procuring agencies choose to collect data on the following:

- The minimum percentages of recovered materials content in the items procured or offered;
- Comparative price information on competitive procurement;
- The quantity of each item procured over a fiscal year;
- The availability of each item with recovered materials content; and
- Performance information related to recovered materials content of an item.

EPA recognizes that a procuring agency may be unable to obtain accurate data for all designated items. However, the Agency believes that in many cases, estimated data will suffice in determining the effectiveness of the agency's affirmative procurement program.

Certification: Certification of the recovered materials content in products is an important mechanism for encouraging the use of recovered materials in finished products. Because each product will be different, EPA recommends that procuring agencies discuss certification with product vendors to ascertain the appropriate period for certifying recovered materials content. EPA recommends that, whenever feasible, the recovered materials content of a product be certified on a batch-by-batch basis or as an average over a calendar quarter or some other appropriate averaging period as determined by the procuring agencies.

II. Specific Recommendations for Procurement of Designated Items

Part A -- Paper and Paper Products

Section A-1 -- Printing and Writing Papers

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for uncoated and coated printing and writing papers on the content levels shown in Tables A-1a, A-1b, and A-1c, respectively. EPA further recommends that if a paper product containing 30% postconsumer fiber is not reasonably available, then procuring agencies establish the highest postconsumer fiber content levels available.

Percentages are based on the fiber weight of the product. The content levels in the tables should be read as X% recovered fiber, including Y% postconsumer fiber and not as X% recovered fiber plus Y% postconsumer fiber. Where the content level is the same in both columns (e.g., 30% in both the recovered fiber and postconsumer fiber columns), this means that EPA is recommending that agencies establish identical content levels for both postconsumer and recovered fiber.

Table A-1a. -- Recommended Recovered Fiber Content Levels for Uncoated Printing and Writing Papers

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Reprographic Paper (e.g., mimeo and duplicator paper, high-speed copier paper, and bond paper*)	30	30
Offset Paper (e.g., offset printing paper*, book paper*, bond paper*)	30	30
Tablet Paper (e.g., office paper such as note pads, stationery* and other writing* papers)	30	30
Forms Bond (e.g., forms, computer printout paper, ledger*)	30	30
Envelope Paper		
Wove	30	30
Kraft		
White and colored (including manila)	10 - 20	10 - 20
Unbleached	10	10
Cotton Fiber Paper (e.g., cotton fiber papers, ledger*, stationery* and matching envelopes, and other writing* papers)	30	30

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Text & Cover Paper (e.g., cover stock, book paper*, stationery* and matching envelopes, and other writing* paper)	30	30
Supercalendered	10	10
Machine finish groundwood	10	10
Papeteries	30	30
Check Safety Paper	10	10

* These items can be made from a variety of printing and writing papers, depending on the performance characteristics of the item. Some of the papers are a commodity-type and some are specialty papers. EPA recommends that procuring agencies determine the performance characteristics required of the paper prior to establishing minimum content standards. For example, bond, ledger, or stationery made from cotton fiber paper or a text & cover paper have different characteristics than similar items made from commodity papers.

Table A-1b. -- Recommended Recovered Fiber Content Levels for Coated Printing and Writing Papers

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Coated Printing Paper	10	10
Carbonless	30	30

Table A-1c. -- Recommended Recovered Fiber Content Levels for Bristols

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
File Folders (manila and colored)	30	30
Dyed Filing Products	20 - 50	20
Cards (index, postal, and other, including index sheets)	50	20
Pressboard Report Covers and Binders	50	20
Tags and Tickets	20 - 50	20

Section A-2 -- Newsprint

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for newsprint on the content levels shown in Table A-2. Percentages are based on the fiber weight of the product. The content levels in the table should be read as X% recovered fiber, including Y% postconsumer fiber and not as X% recovered fiber plus Y% postconsumer fiber.

Table A-2. -- Recommended Recovered Fiber Content Levels for Newsprint

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Newsprint	20 - 100	20 - 85

Section A-3 -- Commercial/Industrial Sanitary Tissue Products

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for commercial/industrial tissue products on the content levels shown in Table A-3. Percentages are based on the fiber weight of the product. The content levels in the table should be read as X% recovered fiber, including Y% postconsumer fiber and not as X% recovered fiber plus Y% postconsumer fiber.

Table A-3. -- Recommended Recovered Fiber Content Levels for
Commercial/Industrial Sanitary Tissue Products

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Bathroom tissue	20 - 100	20 - 60
Paper towels	40 - 100	40 - 60
Paper napkins	30 - 100	30 - 60
Facial tissue	10 - 100	10 - 15
General purpose industrial wipers	40 - 100	40

Section A-4 -- Paperboard and Packaging Products

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for paperboard and packaging products on the content levels shown in Table A-4. Percentages are based on the fiber weight of the product. The content levels in the table should be read as X% recovered fiber, including Y% postconsumer fiber and not as X% recovered fiber plus Y% postconsumer fiber. Where the content level is the same in both columns (e.g., 40% in both the recovered fiber and postconsumer fiber columns), this means that EPA is recommending that agencies establish identical content levels for postconsumer and recovered fiber.

Table A-4. -- Recommended Recovered Fiber Content Levels for Paperboard and Packaging Products

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Corrugated containers* (<300 psi) (300 psi)	25 - 50 25 - 30	25 - 50 25 - 30
Solid Fiber Boxes	40	40
Folding cartons**	100	40 - 80
Industrial paperboard (e.g., tubes, cores, drums, and cans)	100	45 - 100
Miscellaneous (e.g., pad backs, covered binders, book covers, mailing tubes, protective packaging)	90 - 100	75 - 100
Padded mailers	5 - 15	5 - 15
Carrierboard***	10 - 100	10 - 15
Brown papers (e.g., wrap- ping paper and bags)	5 - 40	5 - 20

* The recovered fiber and postconsumer fiber content is calculated from the content of each component relative to the weight each contributes to the total weight of the box. See Appendix I for an example.

** The recommended content ranges are not applicable to all types of paperboard used in folding cartons. Cartons made from solid bleached sulfate or solid unbleached sulfate contain no or small percentages of postconsumer fiber, depending on the paperboard source.

***Carrierboard made from unbleached kraft contains up to 25% recovered fiber, while carrierboard made from recycled paperboard contains up to 100% recovered fiber.

Section A-5 -- Miscellaneous Paper Products

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for the listed paper products on the content levels shown in Table A-5. Percentages are based on the fiber weight of the product. The content levels in the table should be read as 100% recovered fiber, including X% postconsumer fiber and not as 100% recovered fiber plus Y% postconsumer fiber.

Table A-5. – Recommended Recovered Fiber Content Levels for
Miscellaneous Paper Products

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Tray liners	100	50 - 75

Section A-6 -- Other Recommendations for Paper and Paper Products

Measurement: EPA recommends that procuring agencies express their minimum content standards as a percentage of the fiber weight of the paper or paper product. EPA further recommends that procuring agencies specify that mill broke cannot be counted toward postconsumer or recovered fiber content, except that procuring agencies should permit mills to count mill broke generated in a papermaking process using postconsumer and/or recovered fiber as feedstock toward “postconsumer fiber” or “recovered fiber” content, to the extent that the feedstock contained these materials. In other words, if a mill uses less than 100% postconsumer or recovered fiber, only a proportional amount of broke can be counted towards postconsumer or recovered fiber content.

Specifications: EPA recommends that procuring agencies review specifications provisions pertaining to performance and aesthetics and revise provisions that can impede use of postconsumer and recovered fiber, unless such provisions are related to reasonable performance standards. Agencies should determine whether performance provisions are unnecessarily stringent for a particular end use. Agencies also should revise aesthetics provisions -- such as brightness, dirt count, or shade matching -- if appropriate, consistent with the agencies’ performance requirements, in order to allow for a higher use of postconsumer and recovered fiber.

EPA recommends that procuring agencies document determinations that paper products containing postconsumer and recovered fiber will not meet the agencies’ reasonable performance standards. Any determination should be based on technical performance information related to a specific item, not a grade of paper or type of product.

EPA recommends that procuring agencies watch for changes in the use of postconsumer and recovered fiber in paper and paper products. When a paper or a paper product containing postconsumer and recovered fiber is produced in types and grades not previously available, at a competitive price, procuring agencies should either revise specifications to allow the use of such type or grade, or develop new specifications for such type or grade, consistent with the agencies’ performance requirements.

Recyclability: EPA recommends that procuring agencies consider the effect of a procurement of a paper product containing recovered and postconsumer fiber on their paper collection programs by assessing the impact of their decision on their overall contribution to the solid waste stream.

Section A-7 -- Definitions

For purposes of the recommendations contained in this Part, terms shall have the following meanings:

“Postconsumer fiber” means:

- (1) Paper, paperboard, and fibrous wastes from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; and
- (2) All paper, paperboard, and fibrous wastes that enter and are collected from municipal solid waste.

Postconsumer fiber does not include fiber derived from printers’ over-runs, converters’ scrap, and over-issue publications.

“Recovered fiber” means the following materials:

- (1) Postconsumer fiber such as:

- (A) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; and
- (B) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste, and

- (2) Manufacturing wastes such as:

- (A) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and
- (B) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.

“Mill broke” means any paper waste generated in a paper mill prior to completion of the papermaking process. It is usually returned directly to the pulping process. Mill broke is excluded from the definition of “recovered fiber.”

Appendix A-1. -- Example Calculation of Postconsumer Fiber Content of a Corrugated Container

C-flute has a take-up factor of approximately 1.44, which means that for each one foot of combined corrugated board there is 1.44 feet of fluted medium. This factor is used to calculate the weight of paperboard in a given area of combined corrugated board, from which the basis weight of the board is derived. Each linerboard contributes 35% of the basis weight (42/121.4). The medium contributes 30% of the total basis weight (37.4/121.4).

				<u>Board Basis Weight</u> (lbs/MSF)
Linerboard #1	42 x 1.00	=		42.0
Medium	26 x 1.44	=		37.4
Linerboard #2	42 x 1.00	=		<u>42.0</u>
Combined Board Weight				121.4 lbs/MSF

If the linerboard used has 20% postconsumer fiber and the medium has 80% postconsumer fiber, the resulting total postconsumer fiber content of the containerboard is as follows:

$$\begin{aligned}
 \text{Linerboard: } & .35 \times .20 = .07 \times 2 = .14 \text{ (or 14\%)} \\
 \text{Medium: } & .30 \times .80 = .24 \text{ (or 24\%)} \\
 \\
 \text{Total postconsumer fiber: } & .14 + .24 = .38 \text{ (or 38\%)}
 \end{aligned}$$

Part B -- Vehicular Products

Section B-1 -- Lubricating Oil

Preference Program: EPA recommends that procuring agencies set their minimum re-refined oil content standard at the highest level of re-refined oil that they determine meets the statutory requirements of RCRA section 6002(c)(1), but no lower than 25 percent re-refined oil.

EPA recommends that procuring agencies review their procurement practices and eliminate those which would inhibit or preclude procurement of lubricating oils containing re-refined oil. For example, procuring agencies should review the practices of inviting bids and issuing contracts to do the following:

- (1) Supply a broad range of lubricating oil products on an “all or none” basis.
- (2) Supply lubricating oils for an excessively long period of time.
- (3) Deliver lubricating oils to geographic locations throughout the United States or to an excessively broad geographic area.
- (4) Supply excessively large contract quantities.

Specifications: EPA recommends that procuring agencies use the following specifications when procuring lubricating oils containing re-refined oil:

(1) Engine lubricating oils.

- (I) A-A-52039 -- Commercial Item Description, Lubricating Oil, Automotive Engine, API Service SG (replaced MIL-L-46152, Lubricating Oil, Internal Combustion Engine, Administrative Service).
- (ii) API Engine Service Category SF -- 1980 Gasoline Engine Warranty Maintenance Service (or current category)
- (iii) A-A-52306 -- Commercial Item Description, Lubricating Oil, Heavy-Duty Diesel Engine (for wheeled vehicles only)
- (iv) API Engine Service Category CC -- Diesel Engine Service (or current category)
- (v) MIL-L-2104, Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
- (vi) API Engine Service Category CD -- Diesel Engine Service (or current category)
- (vii) MIL-L-21260D (or current version) -- Lubricating Oil, Internal Combustion Engine, Preservative and Break-in
- (viii) MIL-L-46167B (or current version) -- Lubricating Oil, Internal Combustion Engine, Arctic

(2) Hydraulic fluids.

- (I) MIL-H-5606E (or current version) -- Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance
- (ii) MIL-H-6083E (or current version) -- Hydraulic Fluid, Petroleum Base, For Preservation and Operation

(3) Gear oils.

- (I) MIL-L-2105D (or current version) Lubricating Oil, Gear, Multipurpose

(b) Copies of the military specifications can be obtained from: Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.

Section B-2 -- Retread Tires

Preference Program: The following are EPA's recommendations for procuring retreading services and retread tires.

Procurement of tire retreading services for the agencies' used tire casings:

EPA recommends that procuring agencies specify that tire repair and retread services must conform to Federal Specification ZZ-T-441H (or current version).

Procurement of tires through competition between vendors of new tires and vendors of retread tires:

EPA recommends that procuring agencies specify that retread tires must meet the requirements of Federal Specification ZZ-T-381, "Tires, Pneumatic, Vehicular (Highway) (New and Retreaded).

Section B-3 -- Engine Coolants

Preference Program: EPA recommends that procuring agencies whose vehicles are serviced by a motor pool or vehicle maintenance facility establish a program for engine coolant reclamation and reuse, consisting of either reclaiming the spent engine coolants on-site for use in the agencies' vehicles, or establishing a service contract for reclamation of the agencies' spent engine coolant for use in the agencies' vehicles.

EPA also recommends that procuring agencies request reclaimed engine coolant when having their vehicles serviced at commercial service centers. Additionally, EPA recommends that agencies purchase reclaimed engine coolant when making direct purchases of this item such as when necessary to make up for losses due to leakage or spillage.

EPA does not recommend one type of engine coolant over another. However, EPA recommends that procuring agencies purchase engine coolant containing only one base chemical, typically ethylene glycol or propylene glycol, to prevent the commingling of incompatible types of engine coolant.

Section B-4 -- Rebuilt Vehicular Parts

Note: Based on EPA's research, rebuilt vehicular parts generally contain between 60 and 95% postconsumer material. However, this level of detail might not be readily available from distributors to procurement officials. Therefore, EPA is not recommending a range of recovered content.

Preference Program: EPA recommends that procuring agencies whose vehicles (passenger vehicles as well as medium- and heavy-duty equipment, including trucks, cranes, off-road vehicles, and military vehicles) are serviced by a motor pool or vehicle maintenance facility establish a service contract to require the use of rebuilt vehicular parts in the agencies' vehicles or establish a program for vehicular parts rebuilding and reuse consisting of either recovering a used vehicular part and rebuilding it, replacing it with a rebuilt part, or contracting to have the part replaced with a rebuilt part. This designation applies to vehicles served by both on-site and commercial facilities.

Specifications: To be labeled “rebuilt” or “remanufactured,” a part must be processed in accordance with the Federal Trade Commission’s (FTC’s) “Guides for the Rebuilt, Reconditioned and Other Used Automotive Parts Industry,” 16 CFR Part 20. Rebuilders must test each part for compliance with FTC specifications and correct defects as necessary.

Part C -- Construction Products

Note: Refer to Part F - Landscaping Products for additional items that can be used in construction.

Section C-1 - Building Insulation

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-1, procuring agencies establish minimum content standards for use in purchasing building insulation products.

Table C-1. -- Recommended Recovered Materials Content Levels for Building Insulation

Insulation Material	Recovered Materials (Materials and %)
Rock Wool	Slag 75
Fiberglass	Glass cullet 20 - 25
Cellulose loose-fill and spray-on	Postconsumer paper 75
Perlite composite board	Postconsumer paper 23
Plastic, non-woven batt	Recovered and/or postconsumer plastics 100
Plastic Rigid Foam, Polyisocyanurate/polyurethane: Rigid foam	Recovered material 9
Foam-in-place	Recovered material 5
Glass fiber reinforced	Recovered material 6
Phenolic rigid foam	Recovered material 5

Note: The recommended recovered materials content levels are based on the weight (not volume) of materials in the insulating core only.

Specifications: EPA recommends that procuring agencies reference ASTM standard specification D 5359, "Glass Cullet Recovered from Waste for Use in Manufacture of Glass Fiber," in Invitations for Bid and Requests for Proposal.

Section C-2 -- Structural Fiberboard and Laminated Paperboard

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-2, procuring agencies establish minimum content standards for use in purchasing structural fiberboard or laminated paperboard products for use in either insulating or structural applications.

Table C-2.--Recommended Recovered Materials Content Levels for Structural Fiberboard and Laminated Paperboard

Product	Postconsumer Recovered Paper (%)	Total Recovered Materials Content (%)
Structural fiberboards	--	80 - 100
Laminated paperboards	100	100

Note: The recovered materials content levels are based on the weight (not volume) of materials in the insulating core only.

Specifications: EPA recommends that procuring agencies use ASTM Standard Specification C 208 and ANSI/AHA specification A194.1. EPA further recommends that, when purchasing structural fiberboard products containing recovered paper, procuring agencies (1) reference the technical requirements of ASTM C 208, "Insulating Board (Cellulosic Fiber), Structural and Decorative," (2) permit structural fiberboard products made from recovered paper where appropriate, and (3) permit products such as floor underlayment and roof overlay containing recovered paper.

EPA further recommends that procuring agencies review their specifications for insulating products and revise them as necessary to obtain the appropriate "R"-value without unnecessarily precluding the purchase of products containing recovered materials.

Section C-3-- Cement and Concrete

Preference Program: EPA recommends that procuring agencies prepare or revise their procurement programs for cement and concrete or for construction projects involving cement and concrete to allow the use of coal fly ash, ground granulated blast furnace slag (GGBF slag), cenospheres, or silica fume, as appropriate. EPA does not recommend that procuring agencies favor one recovered material over the other. Rather, EPA recommends that procuring agencies consider the use of all of these recovered materials and choose the one (or the mixture of them) that meets their performance requirements, consistent with availability and price considerations. EPA also recommends that procuring agencies specifically include provisions in all construction contracts to allow for the use, as optional or alternate materials, of cement or concrete which contains coal fly ash, GGBF slag, cenospheres, or silica fume, where appropriate. Due to variations in cement, strength requirements, costs, and construction practices, EPA is not recommending recovered materials content levels for cement or concrete containing coal fly ash, GGBF slag, cenospheres, or silica fume. However, EPA is providing the following information about recovered materials content.

- Replacement rates of coal fly ash for cement in the production of blended cement generally do not exceed 20-30 percent, although coal fly ash blended cements may range from 0-40 percent coal fly ash by weight, according to ASTM C 595, for cement Types IP and I(PM). Fifteen percent is a more accepted rate when coal fly ash is used as a partial cement replacement as an admixture in concrete.
- According to ASTM C 595, GGBF slag may replace up to 70 percent of the Portland cement in some concrete mixtures. Most GGBF slag concrete mixtures contain between 25 and 50 percent GGBF slag by weight. EPA recommends that procuring agencies refer, at a minimum, to ASTM C 595 for the GGBF slag content appropriate for the intended use of the cement and concrete.
- According to industry sources, cement and concrete containing cenospheres typically contains a minimum of 10 percent cenospheres (by volume).
- According to industry sources, cement and concrete containing silica fume typically contains silica fume that constitutes 5 to 10 percent of cementitious material on a dry weight basis.

Specifications for Cement and Concrete Containing Fly Ash and Ground Granulated Blast Furnace Slag: For cement and concrete containing coal fly ash and ground granulated blast furnace slag, the following recommendations address guide specifications, materials specifications, contract specifications, performance standards, mix design, and quality control.

- Guide specifications. EPA recommends that procuring agencies ensure that their guide specifications do not inappropriately or unfairly discriminate against the use of coal fly ash or GGBF slag in cement and concrete. EPA further recommends that procuring agencies revise their guide specifications to require that contract specifications for individual construction projects or products allow for the use of coal fly ash or GGBF slag, unless the use of these materials is technically inappropriate for a particular construction application.
- Materials specifications. EPA recommends that procuring agencies use the existing voluntary consensus specifications referenced in Table C-3 for cement and concrete containing fly ash and/or GGBF slag.

Table C-3. -- Recommended Specifications for Cement and Concrete
Containing Recovered Coal Fly Ash and/or Ground Granulated Blast Furnace Slag

Cement specifications	Concrete specifications
ASTM C 595, "Standard Specification for Blended Hydraulic Cements."	ASTM C 618, "Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete."
ASTM C 150, "Standard Specification for Portland Cement."	ASTM C 311, "Standard Methods of Sampling and Testing Fly Ash and Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete."

Cement specifications	Concrete specifications
AASHTO M 240, "Blended Hydraulic Cements."	ASTM C 989, "Ground Granulated Blast-Furnace Slag for Use in Concrete Mortars."
	AASHTO M 302, "Ground Granulated Blast Furnace Slag for Use in Concrete and Mortars."
	American Concrete Institute Standard Practice ACI 226.R1, "Ground Granulated Blast-Furnace Slag as a Cementitious Constituent in Concrete."

- State specifications. EPA recommends that procuring agencies consult other agencies with established specifications for coal fly ash or GGBF slag to benefit from their experience. Procuring agencies can consult the Federal Highway Administration, which maintains a data base of state highway agency material specifications. The States of Alabama, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Maryland, Michigan, North Carolina, North Dakota, Ohio, Pennsylvania, South Carolina, Virginia, and West Virginia have adopted specifications which allow the use of GGBF slag in one or more applications. If needed, procuring agencies can obtain these specifications from the respective state transportation departments and adapt them for use in their programs for cement and concrete, as appropriate.
- Contract specifications. EPA recommends that procuring agencies which prepare or review "contract" specifications for individual construction projects revise those specifications to allow the use of cement and concrete containing coal fly ash or GGBF slag as optional or alternate materials for the project, where appropriate, consistent with the agencies' performance and price objectives.
- Performance standards. EPA recommends that procuring agencies review and, if necessary, revise performance standards relating to cement or concrete construction projects to insure that they do not arbitrarily restrict the use of coal fly ash or GGBF slag, either intentionally or inadvertently, unless the restriction is justified on a job-by-job basis: (1) to meet reasonable performance requirements for the cement or concrete or (2) because the use of coal fly ash or GGBF slag would be inappropriate for technical reasons. EPA recommends that this justification be documented based on specific technical performance information. Legitimate documentation of technical infeasibility for coal fly ash or GGBF slag can be for certain classes of applications, rather than on a job-by-job basis. Procuring agencies should reference such documentation in individual contract specifications to avoid extensive repetition of previously documented points. However, procuring agencies should be prepared to submit such documentation to analysis by interested persons, and should have a review process available in the event of disagreements.
- Mix design. In concrete mix design specifications which specify minimum cement content or maximum water, the cement ratios could potentially unfairly discriminate against the use of coal fly ash or GGBF slag. Such specifications should be changed in order to allow the partial substitution of coal fly ash or GGBF slag for cement in the concrete mixture, unless technically

inappropriate. Cement ratios may be retained, as long as they reflect the cementitious characteristics which coal fly ash or GGBF slag can impart to a concrete mixture, e.g., by considering Portland cement plus coal fly ash or Portland cement plus GGBF slag as the total cementitious component.

- Quality control. Nothing in this RMAN should be construed to relieve the contractor of responsibility for providing a satisfactory product. Cement and concrete suppliers are already responsible both for the quality of the ingredients of their product and for meeting appropriate performance requirements, and will continue to be under this RMAN. Nothing in EPA's recommendations should be construed as a shift in normal industry procedures for assigning responsibility and liability for product quality.
- Additional Considerations:
 - ▶ Procuring agencies should expect suppliers of blended cement, coal fly ash or GGBF slag, and concrete to demonstrate (through reasonable testing programs or previous experience) the performance and reliability of their product and the adequacy of their quality control programs. However, procuring agencies should not subject cement and concrete containing coal fly ash or GGBF slag to any unreasonable testing requirements.
 - ▶ In accordance with standard industry practice, coal fly ash and GGBF slag suppliers should be required to provide to users a statement of the key characteristics of the product supplied. These characteristics may be stated in appropriate ranges. Other characteristics should be requested as needed by the procuring agency.
 - ▶ Agencies desiring a testing or quality assurance program for cements, blended cements, or coal fly ash should contact the U.S. Army Engineer Waterways Experiment Station, P.O. Box 631, Vicksburg, Mississippi 39180.

Specifications for Cement and Concrete containing Cenospheres and Silica Fume: For cement and concrete containing cenospheres, EPA recommends that procuring agencies contact cenosphere suppliers to obtain specifications, such as material safety data sheets for assisting with use of cenospheres in cement and concrete.

For cement and concrete containing silica fume, EPA recommends that procuring agencies refer to the following national specifications and guidelines, which enable procuring agencies to buy high-performance concrete containing silica fume of a standard quality, when purchasing cement and concrete with silica fume: ASTM C1240, AASHTO M840, and ACI 234R-96. ACI 234R-96 describes the properties of silica fume; how silica fume interacts with cement; the effects of silica fume on the properties of fresh and cured concrete; typical applications of silica fume concrete; recommendations on proportions, specifications, and handling of silica fume in the field.

Section C-4 -- Polyester Carpet

Preference Program: EPA recommends that, based on the recovered materials content levels recommended below, procuring agencies establish minimum content standards for use in purchasing polyester carpet for moderate-wear applications such as those found in single-family housing units and other similar applications as identified by the Carpet and Rug Institute (CRI). This recommendation does not include polyester carpet for heavy- or severe-wear or commercial-type applications.

Table C-4.-- Recommended Recovered Materials Content Levels for Polyester Carpet

Product	Resin	Postconsumer Materials (%)
Polyester Carpet Face Fiber	PET	25 - 100

Specifications: Procuring agencies should refer to CRI's table entitled "Use Classification by End-Use Application" for a complete listing of CRI's recommended carpet applications. A copy of this table has been placed in the public docket for this RMAN.

Procuring agencies should also refer to GSA's minimum density recommendations, as follows:

- Cut pile constructions: 5,000 ounces/yard³ minimum density
- Loop pile constructions: 4,500 ounces/yard³ minimum density

While numerous carpet specifications exist, the members of the carpet industry do not utilize any universal standards. Specifications vary and are determined based on the particular factors of the installation. The project's designer, architect, general contractor, and/or facility manager typically decide the specifications. Some procuring agencies, such as the Department of the Army and the Department of Housing and Urban Development, have developed their own specifications for end-use carpet applications. These specifications should be readily available to procurement officials in those agencies.

Section C-5 -- Floor Tiles¹ and Patio Blocks

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-5, procuring agencies establish minimum content standards for use in purchasing heavy-duty/commercial type floor tiles and patio blocks made with rubber or plastic.

Table C-5.-- Recommended Recovered Materials Levels for Floor Tiles and Patio Blocks

Product	Material	Postconsumer Materials (%)	Total Recovered Materials (%)
Patio Blocks	Rubber or Rubber Blends	90 - 100	--
	Plastic or Plastic Blends	--	90 - 100
Floor Tiles (heavy duty/commercial use)	Rubber	90 - 100	--
	Plastic	--	90-100

Notes: EPA's recommendation does not preclude procuring agencies from purchasing floor tiles or patio blocks manufactured from another material. It simply recommends that procuring agencies, when purchasing floor tiles or patio blocks made from rubber or plastic, purchase these items made from recovered materials. Recommendations for floor tiles are limited to heavy-duty/commercial-type applications only.

The recommended recovered materials content levels are based on the dry weight of the raw materials, exclusive of any additives such as adhesives, binders, or coloring agents.

Recommendations for floor tiles are limited to heavy-duty/commercial-type applications only.

¹EPA clarified in 62 *FR* 60995, November 13, 1997 (RMAN II), that the use of floor tiles with recovered materials content may be appropriate only for specialty purpose uses (e.g., raised, open-web tiles for drainage on school kitchen flooring). Such specialty purpose uses involve limited flooring areas where grease, tar, snow, ice, wetness or similar substances or conditions are likely to be present. Thus, EPA has no recovered materials content level recommendations for floor tiles made with recovered materials for standard office or more general purpose uses.

Section C-6 -- Shower and Restroom Dividers/Partitions Containing Recovered Plastic or Steel

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-6, procuring agencies establish minimum content standards for use in purchasing shower and restroom dividers/partitions.

Table C-6.— Recommended Recovered Materials Content Levels for Shower and Restroom Dividers/Partitions Containing Recovered Plastic or Steel

Material	Postconsumer materials (%)	Total recovered materials content (%)
Steel	16	25-30
	67	100
Plastic	20-100	20-100

Notes: EPA's recommendation does not preclude agencies from purchasing shower and restroom dividers/partitions manufactured from another material, such as wood. It simply recommends that procuring agencies, when purchasing shower and restroom dividers/partitions made from plastic or steel, purchase these items made from recovered materials when these items meet applicable specifications and performance requirements.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which 67% is postconsumer.

Specifications: EPA recommends that procuring agencies use the following specifications when procuring shower and restroom dividers/partitions:

- (1) The American Institute of Architects (AIA) has issued guidance for specifying construction materials, including plastic and steel dividers/partitions. The AIA guidance is known throughout the construction industry as the "Masterspec" and is available through the U.S. General Services Administration (GSA).
- (2) U.S. Army Corps of Engineers' Guide Specification CEGS-10160, Toilet Partitions.

Section C-7 -- Reprocessed and Consolidated Latex Paints for Specified Uses

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-7, procuring agencies establish minimum content standards for use in purchasing reprocessed and consolidated latex paints.

Table C-7. -- Recommended Recovered Materials Content Levels for
Reprocessed and Consolidated Latex Paints

Product	Postconsumer latex paint (%)
Reprocessed latex paint	
White, off-white, and pastel colors	20
Grey, brown, earthtones, and other dark colors	50-99
Consolidated latex paint	100

Notes: EPA's recommendations apply to reprocessed latex paints used for interior and exterior architectural applications such as wallboard, ceilings, and trim; gutter boards; and concrete, stucco, masonry, wood, and metal surfaces, and to consolidated latex paints used for covering graffiti, where color and consistency of performance are not primary concerns.

EPA's recommendation does not preclude agencies from purchasing paints manufactured from other, non-latex materials, such as oil-based paints. It simply recommends that procuring agencies, when purchasing latex paints, purchase these items made from postconsumer recovered materials when these items meet applicable specifications and performance requirements.

Reprocessed and consolidated latex paints are available to Federal agencies through the GSA Federal Supply Service by ordering the following stock numbers:

National Stock Numbers

Semi-gloss

8010-01-380-2400
8010-01-380-2405
8010-01-380-2438
8010-01-380-2382
8010-01-380-2331
8010-01-380-2429
8010-01-380-2338
8010-01-380-2379
8010-01-380-2332
8010-01-380-2417
8010-01-380-2353
8010-01-380-2363
8010-01-380-2447

Colors

FEDSTD 595B Color No.

Beige #27769
Blue-gray #26420
Sand-green #26307
Sand-gray #26306
Gray #26134
Dark gray #26081
Green #24491
Sand #23690
Tan #23617
Tan #20372
Sand-yellow #20318
Dark brown #20140
Red brown #20100

<u>Flat</u>	<u>FEDSTD 595B Color No.</u>
8010-01-380-3293	White #37886
8010-01-380-2425	Beige #37769
8010-01-380-2442	Blue-gray #36650
8010-01-380-2381	Gray #36134
8010-01-380-2367	Dark gray #36081
8010-01-380-2396	Blue #35526
8010-01-380-2366	Green #34491
8010-01-380-2421	Sand #33690
8010-01-380-2351	Tan #33617
8010-01-380-2416	Dark brown #30140

The GSA Federal Supply Service has a free paint brochure available by calling 1-800-241-RAIN or FAX requests to (206) 931-7544.

Specifications: EPA has deleted reference to federal specification TT-P-2846, which was cancelled by GSA, and recommends that procuring agencies refer to commercial item description (CID) A-A-3185 instead when purchasing recycled paint.

Section C-8. – Carpet Cushion Made from Bonded Polyurethane, Jute, Synthetic Fiber, or Rubber Containing Recovered Materials

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-8, procuring agencies establish minimum content standards for use in purchasing bonded polyurethane, jute, synthetic fiber, or rubber carpet cushion containing recovered materials.

Table C-8. -- Recommended Recovered Materials Content Levels for
Bonded Polyurethane, Jute, Synthetic Fiber, and Rubber Carpet Cushion

Product	Material	Postconsumer content (%)	Total recovered materials content (%)
Bonded polyurethane	Old carpet cushion	15-50	15-50
Jute	Burlap	40	40
Synthetic fibers	Carpet fabrication scrap	--	100
Rubber	Tire rubber	60-90	60-90

Note: EPA's recommendations do not preclude a procuring agency from purchasing another type of carpet cushion. They simply require that procuring agencies, when purchasing bonded polyurethane, jute, synthetic fiber, or rubber carpet cushions, purchase these items made with recovered materials when these items meet applicable specifications and performance requirements. Refer to Section C-4 in RMAN I for EPA's recommendations for purchasing polyester carpet containing recovered materials.

Specifications: EPA is not aware of carpet cushion specifications unique to carpet cushions containing recovered materials. Therefore, EPA recommends that procuring agencies use any appropriate standards set by the Carpet and Rug Institute and the Carpet Cushion Council when purchasing bonded polyurethane, jute, synthetic fiber, or rubber carpet cushion containing recovered materials.

Section C-9. Flowable Fill Containing Coal Fly Ash and/or Ferrous Foundry Sands

Preference Program: EPA recommends that procuring agencies use flowable fill containing coal fly ash and/or ferrous foundry sands for backfill and other fill applications. EPA further recommends that procuring agencies include provisions in all construction contracts involving backfill or other fill applications to allow for the use of flowable fill containing coal fly ash and/or ferrous foundry sands, where appropriate.

The specific percentage of coal fly ash or ferrous foundry sands used in flowable fill depends on the specifics of the job, including the type of coal fly ash used (Class C or Class F); the strength, set time, and flowability needed; and bleeding and shrinkage. Therefore, EPA is not recommending specific coal fly ash or ferrous foundry sands content levels for procuring agencies to use in establishing minimum content standards for flowable fill. EPA recommends that procuring agencies refer to the mix proportions in Tables C-9a and C-9b for typical proportions for high and low coal fly ash content mixes. EPA further recommends that procuring agencies refer to American Concrete Institute (ACI) report ACI 229R-94 for guidance on the percentages of coal fly ash that can be used in flowable fill mixtures.

Table C-9a. --Typical Proportions for High Fly Ash Content Flowable Fills

Component	Range kg/m ³ (lb/yd ³)	Mix Design kg/m ³ (lb/yd ³)
Fly ash (95%)	949 to 1542 (1600 to 2600)	1234 (2080)
Cement (5%)	47 to 74 (80 to 125)	62 (104)
Added water	222 to 371 (375 to 625)	247 (416)*
Total:		1543 (2600)

* Equal to 189 liters (50 gallons)

Source: "Fly Ash Facts for Highway Engineers," FHWA-SA-94-081, U.S. Department of Transportation, Federal Highway Administration, August 1995.

Table C-9b. --Typical Proportions for Low Fly Ash Content Flowable Fills

Component	Range kg/m ³ (lb/yd ³)	Mix Design kg/m ³ (lb/yd ³)
Fly ash (6% to 14%) [†]	119 to 297 (200 to 500)	178 (300)
Cement	30 to 119 (50 to 200)	59 (100)
Sand	1483 to 1780 (2500 to 3000)	1542 (2600)
Added water	198 to 494 (333 to 833)	297 (500)*
Total:		2076 (3500)

[†]High calcium fly ash is used in lower amounts than low calcium fly ash.

* Equal to 227 liters (60 gallons)

Source: "Fly Ash Facts for Highway Engineers," FHWA-SA-94-081, U.S. Department of Transportation, Federal Highway Administration, August 1995.

Specifications: The following recommendations address mix designs, test methods, and performance standards.

- Mix designs. EPA recommends that procuring agencies use ACI report ACI229R-94, "Controlled Low Strength Materials (CLSM)" and "Fly Ash Facts for Highway Engineers," (FHWA-SA-94-081, U.S. Department of Transportation, Federal Highway Administration, August 1995) in developing mix designs. Among other things, ACI229R-94 addresses materials, including coal fly ash and foundry sands, mix design, and mixing, transporting, and placing. It also provides examples of mixture designs containing coal fly used by the states of Iowa, Florida, Illinois, Indiana, Oklahoma, Michigan, Ohio, and South Carolina. "Fly Ash Facts for Highway Engineers" addresses materials, strength, flowability, time of set, bleeding and shrinkage.

A mix design for the use of foundry sand and coal fly ash in flowable fill was developed for Ford Motor Company. Procuring agencies can obtain a copy of this design by contacting the RCRA Hotline at 1-800-424-9346. Table C-9c provides the recommended trial mixture from this specification.

Table C-9c. -- Materials Quantities for Flowable Fill Mixture
Containing Foundry Sands and Coal Fly Ash

Component	Quantity per Cubic Yard
Cement	50 lbs.
Coal fly ash	250 lbs.
Foundry sand	2850 lbs.
Water	500 lbs.

- Materials specifications and test methods. EPA recommends that procuring agencies use ACI229R-94 and the ASTM standards listed in Table C-9d when purchasing flowable fill or contracting for construction that involves backfilling or other fill applications.

EPA recommends that procuring agencies refer to ASTM C 33-93, “Standard Specification for Concrete Aggregates,” to assure the quality and uniformity of the ferrous foundry sands used as aggregates in flowable fills.

Table C-9d. – Recommended Test Methods for Flowable Fills (Controlled Low Strength Materials)

ASTM Specification Number	Title
D 4832-95e1	Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
D 5239-92	Standard Practice for Characterizing Fly Ash for Use in Soil Stabilization
D 5971-96	Standard Practice for Sampling Freshly Mixed Controlled Low Strength Material
D 6103-07	Standard Test Method for Flow Consistency of Controlled Low Strength Material
D 6023-96	Standard Test Method for Unit Weight, Yield, Cement Content and Air Content (Gravimetric) of Controlled Low Strength Material (CLSM)
D 5971-96	Standard Practice for Sampling Freshly Mixed Controlled Low Strength Material
D 6024-96	Standard Test Method for Ball Drop on Controlled Low Strength Material (CLSM) to Determine Suitability for Load Application

- State specifications. The following states have specifications for flowable fill containing coal fly ash: California, Colorado, Delaware, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, New Mexico, North Carolina, Ohio, Texas, Washington, West Virginia, and Wisconsin.

The state of Ohio has a specification entitled “Flowable Fill Made with Spent Foundry Sand,” and the states of Pennsylvania, Wisconsin, and Indiana are developing specifications for using foundry sands in flowable fill.

If needed, procuring agencies can obtain state specifications from the respective state transportation departments and adapt them for use in their programs. ACI229R-94 includes mix designs from several of these states.

- Contract specifications. EPA recommends that procuring agencies which prepare or review “contract” specifications for individual construction projects revise those specifications to allow the use of flowable fills containing coal fly ash and/or ferrous foundry sands.

- Performance standards. EPA recommends that procuring agencies review and, if necessary, revise performance standards relating to fill materials to insure that they do not arbitrarily restrict or preclude the use of flowable fills containing coal fly ash and/or ferrous foundry sands, either intentionally or inadvertently, unless the restriction is justified on a job-by-job basis: (1) to meet reasonable performance requirements for fill materials or (2) because the use of coal fly ash or ferrous foundry sands would be inappropriate for technical reasons. EPA recommends that this justification be documented based on specific performance information. Legitimate documentation of technical infeasibility can be for certain classes of applications, rather than on a job-by-job basis. Agencies should reference such documentation in individual contract specifications to avoid extensive repetition of previously documented points. However, procuring agencies should be prepared to submit such documentation to scrutiny by interested parties and should have a review process available in the event of disagreements.
- Promotion program: EPA recommends that, as part of the promotion programs required by section 6002(I) of the Resource Conservation and Recovery Act, procuring agencies conduct demonstration programs for using flowable fills containing coal fly ash and/or ferrous foundry sands. EPA further recommends that procuring agencies educate construction contractors about the design, use, and performance of flowable fills containing coal fly ash and/or ferrous foundry sands.

Section C-10. Railroad Grade Crossing Surfaces Made From Recovered Content Concrete, Rubber, Steel, Wood, and Plastic

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-10a, procuring agencies revise their procurement programs for railroad grade crossing surfaces to allow the use of recovered content concrete, rubber, steel, wood, and plastic railroad grade crossing surfaces.

Table C-10a. -- Recommended Recovered Materials Content Levels for Railroad Grade Crossing Surfaces Made From Recovered Content Concrete, Rubber, Steel, Wood, and Plastic

Surface Material	Recovered Material	Postconsumer content (%)	Total recovered materials content (%)
Concrete	Coal Fly Ash	–	15-20
Rubber	Tire Rubber	–	85-95
Steel	Steel	16 67	25-30 100
Wood	Wood or wood composite	90 - 97	90 - 97
Plastic	Plastic or plastic composite	85 - 95	100

Notes: The recommended recovered materials content levels for rubber railroad grade crossing surfaces are based on the weight of the raw materials, exclusive of any additives such as binders or other additives.

Coal fly ash can be used as an ingredient of concrete slabs, pavements, or controlled density fill product, depending on the type of concrete crossing system installed. Higher percentages of coal fly ash can be used in the concrete mixture; the higher percentages help to produce a more workable and durable product but can prolong the curing process.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which 67% is postconsumer.

Railroad grade crossing surfaces made from recovered wood may also contain other recovered materials such as plastics. The percentages of these materials contained in the product would also count toward the recovered materials content level of the item.

Railroad grade crossing surfaces made from recovered plastics may also contain other recovered materials such as auto shredder residue, which contains a mix of materials. The percentages of these materials contained in the product would also count toward the recovered materials content level of the item.

Specifications: EPA recommends that procuring agencies use the ASTM standards listed in Table C-10b when purchasing rubber railroad grade crossing surfaces. EPA recommends that procuring agencies use the ASTM and AASHTO standards listed in Table C-10c when purchasing concrete railroad grade crossing surfaces.

Table C-10b. -- Recommended Specifications for Rubber Railroad Grade Crossings

ASTM Specification Number	Title
D 2000-96	Rubber Products in Automotive Applications
D 2240-97	Rubber Property -- Durometer Hardness
D 412-97	Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers -- Tension
D 297-93	Rubber Products -- Chemical Analysis
E 303-93	Measuring Surface Frictional Properties Using the British Pendulum Tester
D 1171-94	Rubber Deterioration -- Surface Ozone Cracking Outdoors or Chamber (Triangular Specimens)
D 573-88	Deterioration in an Air Oven
D 395-89	Rubber Property -- Compression Set
D 257-93	DC Resistance or Conductance of Insulating Materials
D 2137-94	Rubber Property -- Brittleness Point of Flexible Polymers and Coated Fabrics

Table C-10c. -- Recommended Specifications for Cement and Concrete Containing Recovered Materials

Specification number	Title
ASTM C 595	Standard Specification for Blended Hydraulic Cements
ASTM C 150	Standard Specification for Portland Cement
AASHTO M 240	Blended Hydraulic Cements
ASTM C 618	Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM C 311	Standard Methods of Sampling and Testing Fly Ash and Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete

EPA has not identified any industry specifications or standards for wood or plastic railroad grade crossing surfaces.

Section C-11 --Modular Threshold Ramps Containing Recovered Steel, Rubber, or Aluminum

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-11, procuring agencies establish minimum content standards for use in purchasing modular threshold ramps containing recovered materials.

Table C-11. -- Recommended Recovered Materials Content Levels for Modular Threshold Ramps Containing Recovered Steel, Rubber, or Aluminum

Material	Postconsumer Content (%)	Total Recovered Material Content (%)
Steel	16 - 67	25 - 100
Aluminum	—	10
Rubber	100	100

Notes: The recommended recovered materials content levels for steel in this table reflect the fact that the designated item may contain steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF), or a combination of both. Steel from the BOF process contains 25% - 30% total recovered steel, of which 16% is postconsumer. Steel from the EAF process contains 100% total recovered steel, of which 67% is postconsumer. According to industry sources, modular threshold ramps containing a combination of BOF and EAF steel would contain 25% - 85% total recovered steel, of which 16% - 67% would be postconsumer. Since there is no way of knowing which type of steel was used in the manufacture of the item, the postconsumer and total recovered material content ranges in this table encompass the whole range of possibilities, i.e., the use of EAF steel only, BOF steel only, or a combination of the two.

These recommendations are for modular threshold ramps. EPA understands that ramps may also be constructed of cement and concrete. For these ramps, procuring agencies should follow the procurement guidelines for cement and concrete containing recovered materials.

Specifications: Although the federal government is not governed by ADA, the Access Board's ADA standards are more current than the UFAS and are therefore generally used by federal facilities. According to the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities" (28 CFR Part 36), published in the Federal Register, July 26, 1991, ground and floor surfaces along accessible routes and in accessible rooms and spaces including floors, walks, ramps, stairs, and curbs, must be stable, firm, and slip-resistant. The guidelines do not define what is meant by "stable, firm, and slip-resistant," but the Access Board recommends static coefficient of friction values of 0.8 for ramps and 0.6 for accessible routes.

Section C-12 --Nonpressure Pipe Containing Recovered Steel, Plastic, or Cement

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-12a, procuring agencies establish minimum content standards for use in purchasing nonpressure pipe containing recovered materials.

Table C-12a. -- Recommended Recovered Materials Content Levels for Nonpressure Pipe Containing Recovered Steel, Plastic, or Cement

Material	Postconsumer content (%)	Total recovered materials content (%)
Steel	16 67	25 - 30 100
HDPE	100	100
PVC	5 - 15	25 - 100
Cement	Refer to cement and concrete recommendations in C-3 of the RMAN	

Note: The recommended recovered materials content levels for steel in this table reflect the fact that the designated item can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered steel, of which, 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which, 67% is postconsumer steel.

Specifications: EPA recommends that procuring agencies refer to the following tables C-12b, C-12c, C-12d, and C-12e when purchasing nonpressure pipe containing recovered materials.

Table C-12b. -- ASTM Plastic Pipe Specifications

F1960, Standard Specification for Co-extruded Poly(Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed Recycled Content
F1732, Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer and Drain Pipe Containing Recycled PVC Material
D1248, Standard Specification for Polyethylene Plastics Molding and Extrusion Materials
F810, Smooth wall Polyethylene (PE) Pipe for Use in Drainage and Waste Absorption Fields
F405, Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings
F512, Standard Specification for Poly(vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation
F667, Standard Specification for Large Diameter Corrugated Polyethylene Tubing and Fittings
F949, Standard Specification for Poly (Vinyl Chloride (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
D2665, Standard Specification for Poly(vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
D3034, Standard Specification for Type PSM (Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
D2239, Standard Specifications for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
D2447, Standard Specification for Polyethylene (PE) Plastic Pipe Schedules 40 and 80, Based on Controlled Outside Diameters
D2729-96a, Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
D3035, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
D4976, Standard Specification for Polyethylene Plastic Molding and Extrusion Materials
D3350, Standard Specification for Polyethylene Plastic Pipe and Fitting Materials
D4396, Standard Specification for Rigid Poly(Vinyl) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Nonpressure Applications
F810, Standard Specification for Smooth wall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields
F405, Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings
F1970, Standard Specification for Special Engineered Fittings or Appurtenances for Use in Poly Vinyl (Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems

Note: ASTM Committee C13 on Concrete Pipe is responsible for the formulation and review of specifications, test methods and definitions for concrete pipe and develops and reviews practices and guides covering design, installation, testing, economic evaluation, and performance of concrete pipe systems. While the previous ceiling on fly ash content had been set at 25 percent, in 1999, ASTM Committee C13 removed all limitations on fly ash content in pipe.

Table C-12c. – ASTM Concrete Pipe Specifications

C14-99, Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe
C118-99, Standard Specification for Concrete Pipe for Irrigation or Drainage
C412-99, Standard Specification for Concrete Drain Tile
C444-95, Standard Specification for Perforated Concrete Pipe
C505-99a, Standard Specification for Nonreinforced Concrete Irrigation Pipe With Rubber Gasket Joints
C654-99, Standard Specification for Porous Concrete Pipe
C76-99, Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C506-99, Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
C507-99, Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
C478-97, Standard Specification for Precast Reinforced Concrete Manhole Sections

Table C-12d. -- ASTM and AASHTO Specifications for Steel Pipe

Material	Description	AASHTO Specifications	ASTM Specifications
Zinc Coated Sheets and Coils	Steel base metal* with 610 g/m ² (2 oz/ft ²) zinc coating	M-218	A929M
Polymer Coated Sheets and Coils	Polymer coatings applied to sheets* and coils* 9.25 mm (0.010 in.) thickness each side	M-246	A742M
Fiber Bonded Coated Coils	Steel base metal with zinc coating and fibers pressed into the zinc while molten to form fiber bonded coating	--	A885
Aluminum Coated	Steel base metal* coated with 305 g/m ² (1 oz/ft ²) of pure aluminum	M-274	A929M

Material	Description	AASHTO Specifications	ASTM Specifications
Sewer and Drainage Pipe	Corrugated pipe fabricated from any of the above sheets or coils. Pipe is fabricated by corrugating continuous coils into helical “from with lockseam or welded seam, or by” rolling annular corrugated mill sheets and riveting seams:		
	Galvanized corrugated steel pipe	M-36	A760M
	Polymeric pre-coated sewer and drainage pipe	M-245	A762M
	Fiber bonded impregnated corrugated steel pipe	--	A760M
	Aluminized corrugated steel pipe	M-36	A760M
	Structural plate pipe	M-167	A761M
Asphalt Coated Steel Sewer Pipe	Corrugated steel pipe of any of the types shown above with a 1.3 mm (0.0050 in.) high purity asphalt cover	M-190	A849 A862
Invert Paved Steel Sewer Pipe	Corrugated steel pipe of any one for the types shown above with an asphalt pavement poured in the invert to cover the corrugation by 3.2 mm (1/8 in.)	M-190	A849 A862
Fully Lined Steel	With an internal asphalt lining centrifugally spun in place	M-190	A849 A862
	Corrugated steel pipe with a single thickness of smooth sheet fabricated with helical ribs projected outward	M-36	A760M
	With an internal concrete lining in place	M-36	A760M
	Corrugated steel pipe with a smooth steel linter integrally formed with the corrugated shell.	M-36	A760M
Cold Applied Bituminous Coatings	Fibrated mastic or coat tar base coatings of various viscosities for field or shop coating of corrugated pipe or structural plate	M-243	A849

Material	Description	AASHTO Specifications	ASTM Specifications
Gaskets and Sealants	Standard O-ring gasket	--	D1056
	Gasket strips, butyl or neoprene	--	C361

Notes: * Yield point 0230Mpa (33ksi) min.; tensile strength -310Mpa (45 ksi) min.; Elongation (50 mm/2 in.) - 20% min.

AASHTO pipe specifications restrict the use of recycled plastic through the reference to “rework” material. Specifications referenced by those who commented in 1994 are listed in Table C-12e. AASHTO’s specifications are updated annually.

Table C-12e. – American Association of State Highway and Transportation Officials Pipe Specifications (1994)

M 252-93, Corrugated Polyethylene Drainage Tubing
M 294-93, Corrugated Polyethylene Pipe
M278, Class PS 46 Polyvinyl Chloride (PVC) Pipe
Section 18, Standard Specifications for Highway Bridges

Section C-14. Roofing Materials Containing Recovered Steel, Aluminum, Fiber, Rubber, Plastic or Plastic Composites, or Cement

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table C-14, procuring agencies establish minimum content standards for use in purchasing or procuring roofing materials or services. EPA’s research indicates that wood shakes and shingles as well as asphalt/plastic composite roofing materials can be made from recovered materials, but we were unable to identify recycled-content percentages in these products. In the case of asphalt/plastic composite roofing materials, EPA found that the plastic was the recovered material in the items, not the asphalt.

Table C-14. – Recommended Recovered Materials Content Levels for Roofing Materials Containing Recovered Steel, Aluminum, Fiber, Rubber, Plastic or Plastic Composites, or Cement

Material	Postconsumer content (%)	Total recovered materials content (%)
Steel	16 67	25 - 30 100
Aluminum	20 - 95	20 - 95
Fiber (Felt) or Fiber Composite	50 - 100	50-100
Rubber	12 - 100	100
Plastic or Plastic/Rubber Composite	100	100
Wood/Plastic Composite	—	100

Material	Postconsumer content (%)	Total recovered materials content (%)
Cement	Refer to cement and concrete recommendations in C-3 of the RMAN	

Note: The recommended recovered materials content levels for steel in this table reflect the fact that the designated item can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered steel, of which, 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which, 67% is postconsumer steel.

Specifications: EPA recommends that procuring agencies refer to the 186 standards for roofing products maintained by ASTM's Committee D08 on Roofing, Waterproofing, and Bituminous Materials. The specifications, however, do not discuss use of recovered materials, nor do they preclude the use of recovered materials.

Part D --Transportation Products

Section D-1 -- Temporary Traffic Control Devices

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table D-1, procuring agencies establish minimum content standards for use in purchasing traffic cones and traffic barricades.

Table D-1.-- Recommended Recovered Materials Content Levels for Traffic Cones and Traffic Barricades

Product	Material	Postconsumer Materials (%)	Total Recovered Materials (%)
Traffic Cones	PVC, LDPE, Crumb Rubber	--	50 - 100
Traffic Barricades	HDPE, LDPE, PET	80 - 100	100
	Steel	16	25-30
		67	100
	Fiberglass	--	100

Notes: The recommended recovered materials content levels are based on the dry weight of the raw materials, exclusive of any additives such as adhesives, binders, or coloring agents.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which 67% is postconsumer.

Section D-2 -- Parking Stops Made from Concrete or Containing Recovered Plastic or Rubber

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table D-2, procuring agencies establish minimum content standards for use in purchasing parking stops.

Table D-2. -- Recommended Recovered Materials Content Levels for Parking Stops Made from Concrete or Containing Recovered Plastic or Rubber

Material	Postconsumer content (%)	Recovered materials content (%)
Plastic and/or rubber	100	-----
Concrete containing coal fly ash	-----	20-40
Concrete containing GGBF slag	-----	25-70

Notes: EPA's recommendation does not preclude a procuring agency from purchasing parking stops manufactured from another material. It simply requires that a procuring agency, when purchasing concrete parking stops or parking stops made with plastic or rubber, purchase these items made with recovered materials when these items meet applicable specifications and performance requirements.

Parking stops made with recovered plastics may also include other recovered materials such as sawdust, wood, or fiberglass. The percentage of these materials contained in the product would also count toward the recovered materials content level of the parking stops.

ASTM specification C595M-95 Standard Specification for Blended Hydraulic Cements specifies the appropriate mix design, including recovered materials content, for concrete containing coal fly ash and GGBF slag.

Section D-3 -- Channelizers, Delineators, and Flexible Delineators Containing Recovered Plastic, Rubber, or Steel

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table D-3, procuring agencies establish minimum content standards for use in purchasing channelizers, delineators, and flexible delineators.

Table D-3. -- Recommended Recovered Materials Content Levels for Channelizers, Delineators, and Flexible Delineators Containing Recovered Plastic, Rubber, or Steel

Product	Material	Postconsumer content (%)
Channelizers	Plastic	25-95
	Rubber (base only)	100
Delineators	Plastics	25-90
	Rubber (base only)	100
	Steel (base only)	16% postconsumer and 25-30% total recovered materials or 67% postconsumer and 100% total recovered materials
Flexible delineators	Plastic	25-85

Notes: EPA's recommendation does not preclude a procuring agency from purchasing channelizers, delineators, or flexible delineators manufactured from another material. It simply requires that a procuring agency, when purchasing these items made from rubber, plastic, or steel, purchase them made with recovered materials when these items meet applicable specifications and performance requirements.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which 67% is postconsumer.

Specifications: EPA recommends that procuring agencies use the following specifications when procuring channelizers, delineators, and flexible delineators:

(1) The Federal Highway Administration's Manual on Uniform Traffic Control Devices contains specifications for the size, shape, mounting, and placement of temporary traffic control devices.

(2) The States of Florida and North Carolina have specifications that require the use of recovered materials in their flexible delineators. The California Department of Transportation (CALTRANS) has specifications for “Drivable Flexible Plastic Guide Marker and Clearance Marker Posts.” A copy of these specifications are available from the RCRA Hotline at 1-800-424-9346.

Part E -- Park and Recreation Products

Section E-1 -- Playground Surfaces and Running Tracks

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table E-1, procuring agencies establish minimum content standards for use in purchasing playground surfaces and running tracks made of rubber or plastic.

Table E-1.-- Recommended Recovered Materials Content Levels for Playground Surfaces and Running Tracks

Product	Material	Postconsumer Recovered Materials (%)
Playground Surfaces	Rubber or Plastic	90 - 100
Running Tracks	Rubber or Plastic	90 - 100

Notes: EPA's recommendation does not preclude procuring agencies from purchasing playground surfaces or running tracks manufactured from another material. It simply recommends that procuring agencies, when purchasing playground surfaces or running tracks made from rubber or plastic, purchase these items made from recovered materials.

The recommended recovered materials content levels are based on the dry weight of the raw materials, exclusive of any additives such as adhesives, binders, or coloring agents.

Section E-2 --Plastic Fencing Containing Recovered Plastic for Specified Uses

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table E-2, procuring agencies establish minimum content standards for use in purchasing plastic fencing for use in controlling snow or sand drifting and as a warning/safety barrier in construction or other applications.

Table E-2. -- Recommended Recovered Materials Content Levels for Fencing Containing Recovered Plastic

Material	Postconsumer content (%)	Total recovered materials content (%)
Plastic	60-100	90-100

Note: EPA's recommendation does not preclude a procuring agency from purchasing fencing manufactured from another material, such as wood. It simply requires that a procuring agency, when purchasing plastic fencing, purchase this item made with recovered materials when this item meets applicable specifications and performance requirements.

Specifications: The State of New York developed a specification for orange-colored plastic fencing used for snow barriers, warning barriers, and safety barriers, but discontinued its use because the state did not purchase enough fencing to warrant maintaining the specification. Height varied, depending on application, from four to six feet. Weight varied from 17 pounds per 100 foot section for warning barriers to 48 pounds per 100 foot section for snow fencing to 66 pounds per 100 foot section for six-foot safety barrier fencing. The New York specification also addressed mesh size, porosity, service

temperature range, and strength for each application. A copy of this specification is available from the RCRA Hotline by calling 1-800-424-9346.

Section E-3. Picnic Tables and Park Benches Containing Recovered Steel, Aluminum, or Plastic

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table E-3a, procuring agencies establish minimum content standards for use in purchasing aluminum, steel, or plastic park benches and picnic tables containing recovered materials.

Table E-3a. -- Recommended Recovered Materials Content Levels for Park Benches and Picnic Tables Containing Recovered Aluminum, Steel, Concrete or Plastic

Material	Postconsumer content (%)	Total recovered materials content (%)
Plastics	90-100	100
Plastic composites	50 - 100	100
Aluminum	25	25
Concrete	--	15-40
Steel	16 67	25-30 100

Notes: "Plastics" includes both single and mixed plastic resins. Picnic tables and park benches made with recovered plastics may also contain other recovered materials such as sawdust, wood, or fiberglass. The percentage of these materials contained in the product would also count toward the recovered materials content level of the item.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which 67% is postconsumer.

EPA's recommendations do not preclude a procuring agency from purchasing park benches or picnic tables made from other materials. They simply require that procuring agencies, when purchasing park benches or picnic tables made from plastic, aluminum, concrete, or steel purchase these items made with recovered materials when these items meet applicable specifications and performance requirements.

Specifications: EPA did not identify any specifications for park benches or picnic tables made from steel, concrete, or aluminum. EPA recommends that procuring agencies ensure that there is no language in their specifications for park benches or picnic tables that would preclude or discourage the use of products containing recovered materials.

EPA recommends that procuring agencies use the ASTM specifications referenced in Table E-3b for park benches and picnic tables made from plastic lumber.

Table E-3b. -- Recommended Specifications for Plastic Lumber Used In Park Benches and Picnic Tables

ASTM Specification Number	Title
D 6108-97	Standard Test Method for Compressive Properties of Plastic Lumber
D 6109-97	Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastic Lumber
D 6111-97	Standard Test Method for Bulk Density and Specific Gravity of Plastic Lumber and Shapes by Displacement
D 6112-97	Standard Test Method for Compressive and Flexural Creep and Creep Rupture of Plastic Lumber and Shapes
D 6117-97	Standard Test Method for Mechanical Fasteners in Plastic Lumber and Shapes

Section E-4. Playground Equipment

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table E-4a, procuring agencies establish minimum content standards for use in purchasing playground equipment made from plastic lumber, steel, or aluminum containing recovered materials.

Table E-4a. -- Recommended Recovered Materials Content Levels for Playground Equipment Containing Recovered Plastic, Steel, or Aluminum

Material	Postconsumer content (%)	Total recovered materials content (%)
Plastics	90 - 100	100
Plastic Composites	50 - 75	95 - 100
Steel	16 67	25-30 100
Aluminum	25	25

Notes: "Plastics" includes both single and mixed plastic resins. Playground equipment made with recovered plastics may also contain other recovered materials such as wood or fiberglass. The percentage of these materials contained in the product would also count toward the recovered materials content level of the item.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which 67% is postconsumer.

EPA's recommendations do not preclude a procuring agency from purchasing playground equipment made from other materials. They simply require that procuring agencies, when purchasing playground equipment made from plastic, aluminum, or steel purchase these items made with recovered materials when the item meets applicable specifications and performance requirements.

Specifications: EPA recommends that procuring agencies use the specifications in Table E-4b when procuring playground equipment. Playground equipment may also be subject to state and local codes and standards as well as Federal child safety laws. EPA also recommends that procuring agencies use the ASTM specifications referenced in Table E-4c for playground equipment made from plastic lumber.

Table E-4b. -- Recommended Safety Specifications for Playground Equipment

Specification	Title
Consumer Product Safety Commission (CPSC) Publication No. 325	Handbook for Public Playground Safety
ASTM F-1487-95	Safety Performance Specification for Playground Equipment for Public Use

Table E-4c. -- Recommended Specifications for Plastic Lumber Used In Playground Equipment

ASTM Specification Number	Title
D 6108-97	Standard Test Method for Compressive Properties of Plastic Lumber
D 6109-97	Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastic Lumber
D 6111-97	Standard Test Method for Bulk Density and Specific Gravity of Plastic Lumber and Shapes by Displacement
D 6112-97	Standard Test Method for Compressive and Flexural Creep and Creep Rupture of Plastic Lumber and Shapes
D 6117-97	Standard Test Method for Mechanical Fasteners in Plastic Lumber and Shapes

Part F -- Landscaping Products

Section F-1 -- Hydraulic Mulch

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table F-1, procuring agencies establish minimum content standards for paper-based and wood-based hydraulic mulch products.

Table F-1.-- Recommended Recovered Materials Content Levels for Hydraulic Mulch Products

Hydraulic Mulch Products	Recovered Materials (Materials and %)
Paper-Based Hydraulic Mulch	Postconsumer recovered paper 100
Wood-Based Hydraulic Mulch	Recovered wood and/or paper 100

Note: The recommended recovered materials content levels are based on the dry weight of the fiber, exclusive of any dyes, wetting agents, seeds, fertilizer, or other non-cellulose additives.

Section F-2 --Compost Made from Yard Trimmings and/or Food Waste

Preference Program: EPA recommends that procuring agencies purchase or use compost made from yard trimmings, leaves, grass clippings and/or food wastes in such applications as landscaping, seeding of grass or other plants on roadsides and embankments, as nutritious mulch under trees and shrubs, and in erosion control and soil reclamation.

EPA further recommends that those procuring agencies that have an adequate volume of yard trimmings, leaves, grass clippings, and/or food wastes, as well as sufficient space for composting, should implement a composting system to produce compost from these materials to meet their landscaping and other needs.

Specifications: EPA recommends that procuring agencies ensure that there is no language in their specifications relating to landscaping, soil amendments, erosion control, or soil reclamation that would preclude or discourage the use of compost. For instance, if specifications address the use of straw or hay in roadside revegetation projects, procuring agencies should assess whether compost could substitute for straw or hay or be used in combination with them.

The U.S. Department of Transportation's "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects 1996," specifies compost as one of the materials suitable for use in roadside revegetation projects associated with road construction. These standards do not preclude the use of compost made from yard trimmings, leaves, grass, clippings, and/or food waste.

The State of Maine has developed quality standards for compost products that are used by its agencies and/or purchased with state funds. The quality standards have been set for six types of compost products, ranging from topsoil (three classes), to wetland substrate, to mulch (two classes). For each of these types of compost product, standards for maturity, odor, texture, nutrients, pH, salt content, organic

content, pathogen reduction, heavy metals, foreign matter, moisture content, and density have been established. EPA recommends that procuring agencies obtain and adapt this or another suitable specification for their use in purchasing compost products.

The Composting Council is helping to define and develop industry wide standards for composts made from various combinations of materials, including yard trimmings, leaves, grass clippings, and food wastes. The Composting Council publishes these standards in an operating guide for composting facilities entitled, "Test Methods for Examination of Composting and Compost." The guide also provides standards for the suitability of different types of composts made for different applications, depending on the compost mix.

Section F-3 -- Garden and Soaker Hoses Containing Recovered Plastic or Rubber

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table F-3, procuring agencies establish minimum content standards for use in purchasing garden and soaker hoses.

Table F-3. -- Recommended Recovered Materials Content Levels for Garden and Soaker Hoses Containing Recovered Plastic or Rubber

Product	Material	Postconsumer content (%)
Garden hose	Rubber and/or plastic	60-65
Soaker hose	Rubber and/or plastic	60-70

Note: EPA's recommendation does not preclude a procuring agency from purchasing garden and soaker hoses manufactured from another material. It simply requires that a procuring agency, when purchasing garden and soaker hoses made from plastic or rubber, purchase these items made with recovered materials when these items meet applicable specifications and performance requirements.

The Green Seal specification for watering hoses includes a 50 percent postconsumer content level. However, all companies from which EPA obtained information manufacture garden and/or soaker hoses with at least 60 percent postconsumer content.

Specifications: EPA recommends that procuring agencies use the following specifications when procuring garden and soaker hoses:

(1) ASTM D3901 Consumer Specification for Garden Hose. The specification addresses physical and performance characteristics (pressure, tensile, and ripping strength tests) and states that the material components are to be agreed upon by the purchaser and seller.

(2) Green Seal GC-2: Watering Hoses. The standard calls for the use of 50 percent postconsumer rubber material in garden hoses and 65 percent postconsumer rubber material in soaker hoses. EPA recommends that, when purchasing garden hoses, procuring agencies reference the technical requirements of this specification but set a higher content standard.

Section F-4 -- Lawn and Garden Edging Containing Recovered Plastic or Rubber

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table F-4, procuring agencies establish minimum content standards for use in purchasing lawn and garden edging.

Table F-4. -- Recommended Recovered Materials Content Levels for Lawn and Garden Edging Containing Recovered Plastic or Rubber

Material	Postconsumer content (%)	Total recovered materials content (%)
Plastic and/or rubber	30-100	30-100

Note: EPA's recommendation does not preclude a procuring agency from purchasing lawn and garden edging manufactured from another material, such as wood. It simply requires that a procuring agency, when purchasing lawn and garden edging made from plastic and/or rubber, purchase these items made with recovered materials when these items meet applicable specifications and performance requirements.

Section F-5. Plastic Lumber Landscaping Timbers and Posts Containing Recovered Materials

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table F-5a, procuring agencies establish minimum content standards for use in purchasing plastic lumber landscaping timbers and posts containing recovered materials.

Table F-5a. -- Recommended Recovered Materials Content Levels for Plastic Lumber Landscaping Timbers and Posts

Material	Postconsumer content (%)	Total recovered materials content (%)
HDPE	25-100	75-100
Mixed Plastics/Sawdust	50	100
HDPE/Fiberglass	75	95
Other mixed resins	50-100	95-100

Note: EPA's recommendations do not preclude a procuring agency from purchasing wooden landscaping timbers and posts. They simply require that procuring agencies, when purchasing plastic landscaping timbers and posts purchase these items made with recovered materials when the items meet applicable specifications and performance requirements.

Specifications: EPA recommends that procuring agencies use the ASTM specifications referenced in Table F-5b for plastic lumber landscaping timbers and posts.

Table F-5b. -- Recommended Specifications for Plastic Lumber Landscaping Timbers and Posts

ASTM Specification Number	Title
D 6108-97	Standard Test Method for Compressive Properties of Plastic Lumber
D 6109-97	Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastic Lumber
D 6111-97	Standard Test Method for Bulk Density and Specific Gravity of Plastic Lumber and Shapes by Displacement
D 6112-97	Standard Test Method for Compressive and Flexural Creep and Creep Rupture of Plastic Lumber and Shapes
D 6117-97	Standard Test Method for Mechanical Fasteners in Plastic Lumber and Shapes

Part G -- Non-Paper Office Products

Section G-1 -- Office Recycling Containers and Office Waste Receptacles

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table G-1, procuring agencies establish minimum content standards for use in purchasing office recycling containers and office waste receptacles.

Table G-1.-- Recommended Recovered Materials Content Levels for Office Recycling Containers and Office Waste Receptacles

Product	Recovered Materials (materials and percent)
Office Recycling Containers and Office Waste Receptacles	Plastic: 20 - 100 Postconsumer Recovered Materials Paper: Refer to the Paper Products Recommendations in Part A of RMAN Steel: 16% postconsumer and 25% - 30% total recovered materials

Note: EPA's recommendations for office recycling containers and office waste receptacles containing recovered plastic, paper, or steel do not preclude a procuring agency from purchasing containers or receptacles manufactured from another material, such as wood. They simply require that procuring agencies, when purchasing office recycling containers or office waste receptacles manufactured from plastic, paper, or steel, purchase these items made with recovered materials when the items meet applicable specifications and performance requirements.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items are made from steel manufactured in a Basic Oxygen Furnace (BOF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel.

Section G-2 -- Plastic Desktop Accessories

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table G-2, procuring agencies establish minimum content standards for use in purchasing plastic desktop accessories. If items are not available within the recommended range, procuring agencies should seek the items with the highest percentage of recovered materials practicable.

Table G-2. -- Recommended Recovered Materials Content Levels for Plastic Desktop Accessories

Product	Postconsumer Recovered Materials (Material and %)
Plastic Desktop Accessories	Polystyrene 25 - 80

Note: EPA's recommendation does not preclude procuring agencies from purchasing a desktop accessory manufactured from another material, such as paper, wood, or steel. It simply recommends that, when purchasing plastic desktop accessories, procuring agencies purchase these items made from recovered materials.

Section G-3 -- Toner Cartridges

Preference Program: EPA recommends that procuring agencies establish procedures and policies that give priority to remanufacturing the agencies' expended toner cartridges. EPA recommends that, under such policies and procedures, procuring agencies procure remanufacturing services for expended cartridges and, when such services are unavailable or not practicable, obtain remanufactured toner cartridges or new toner cartridges made with recovered materials from product vendors.

Section G-4 -- Binders

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table G-3, procuring agencies establish minimum content standards for use in purchasing binders.

Table G-3. -- Recommended Recovered Materials Content Levels for Binders

Product	Recovered Materials (Materials and %)
Plastic-Covered Binders (Plastic Covering)	Plastic 25 - 50
Chipboard, Paperboard, or Pressboard Binders or Binder Components	Paper Refer to Paper Products Recommendations in Part A of RMAN

Notes: The chipboard, paperboard, or pressboard binders or components of plastic-covered binders or binders covered with another material, such as cloth, are covered under the recommendation for paper and paper products (see Part A of the RMAN).

EPA's recommendations do not preclude procuring agencies from purchasing binders covered with or manufactured using another material, such as cloth. It simply recommends that procuring agencies, when purchasing binder types designated in the procurement guidelines, purchase these binders containing recovered materials.

Specifications: GSA's specification for binders, A-A-2549A, covers four types of binders, including cloth bound, flexible cover; cloth bound, stiff cover; plastic bound, flexible cover; and plastic bound, stiff cover. In the specification, GSA requires its binders to contain "a minimum of 100% waste paper, including a minimum of 30% postconsumer recovered materials."

Section G-5 -- Plastic Trash Bags

Preference Program: EPA recommends that, based on the content levels shown in Table G-4, procuring agencies establish minimum content standards for use in purchasing plastic trash bags.

Table G-4 .-- Recommended Recovered Materials Content Levels for Plastic Trash Bags

Product	Postconsumer Recovered Materials (Material and %)
Plastic Trash Bags	Plastic 10 - 100

Note: EPA's recommendation does not preclude procuring agencies from purchasing a trash bag manufactured using another material, such as paper. It merely recommends that procuring agencies, when purchasing plastic trash bags, purchase these items made from recovered materials.

Section G-6 -- Printer Ribbons

Preference Program: Minimum content standards are not appropriate for remanufactured items, such as printer ribbons, because a core part of the item is reused in the new product, even though certain components of a printer ribbon may contain recovered materials. In lieu of content standards, EPA recommends that procuring agencies adopt one or both of the following approaches: (1) procure printer ribbon reinking or reloading services or (2) procure reinked or reloaded printer ribbons. EPA further recommends that procuring agencies establish policies that give priority to reinking or reloading their expended printer ribbons. If reinking and reloading services are unavailable, procuring agencies should attempt to purchase reinked or reloaded printer ribbons. GSA offers remanufactured printer ribbons on the New Item Introductory Schedule (NIIS).

Specifications: The State of Alabama has a specification for reinked ribbons which requires the ribbons to be vacuum cleaned, reinked, and rewound to proper tension. A copy of this specification is available from the RCRA Hotline at 1-800-424-9346.

Section G-7 -- Plastic Envelopes

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table G-7, procuring agencies establish minimum content standards for use in purchasing plastic envelopes.

Table G-7. -- Recommended Recovered Materials Content Levels for Plastic Envelopes

Material	Postconsumer content (%)	Total recovered materials content (%)
Plastic	25	25-35

Note: EPA's recommendation does not preclude a procuring agency from purchasing envelopes manufactured from another material, such as paper. It simply requires that a procuring agency, when purchasing envelopes made from plastic, purchase these items made with recovered materials when these items meet applicable specifications and performance requirements. Procuring agencies should note, however, that paper envelopes fall within the scope of EPA's previous designation of paper and paper products. EPA issued postconsumer and recovered materials content recommendations for paper products, including envelopes, in the Paper Products RMAN, which was issued in the FEDERAL REGISTER on May 29, 1996 at 61 FR 26985. A copy of the Paper Products RMAN is available from the RCRA Hotline at 1-800-424-9346 and electronically via EPA's Public Access Server at <http://www.epa.gov/fedrgstr/search.htm>.

Specifications:

(1) GSA, the Government Printing Office (GPO), and the U.S. Postal Service (USPS) all currently purchase plastic envelopes made from Tyvek® containing recovered HDPE. GSA specifies “DuPont Tyvek® or equal.” USPS requires “DuPont Tyvek®.” GPO requires “white spunbonded polyethylene with the characteristics of DuPont’s product no. 1073;” the title of the solicitation, however, states “Tyvek® envelopes or similar.”

(2) The Navy requests that plastic envelopes not be sent to ships in order to minimize onboard disposal of plastic.

Section G-8. Solid Plastic Binders, Plastic Clipboards, Plastic File Folders, Plastic Clip Portfolios, and Plastic Presentation Folders Containing Recovered Plastic

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table G-8, procuring agencies establish minimum content standards for use in purchasing solid plastic binders, plastic clipboards, plastic file folders, plastic clip portfolios, and plastic presentation folders containing recovered materials.

Table G-8. -- Recommended Recovered Materials Content Levels for Solid Plastic Binders, Clipboards, File Folders, Clip Portfolios, and Presentation Folders

Product	Material	Postconsumer content (%)	Total recovered materials content (%)
Solid plastic binders	HDPE	90	90
	PE	30-50	30-50
	PET	100	100
	Misc. Plastics	80	80
Plastic clipboards	HDPE	90	90
	PS	50	50
	Misc. Plastics	15	15-80
Plastic file folders	HDPE	90	90
Plastic clip portfolios	HDPE	90	90
Plastic presentation folders	HDPE	90	90

Notes: EPA’s recommendations do not preclude a procuring agency from purchasing binders, clipboards, file folders, clip portfolios, or presentation folders made from another material, such as paper. They simply require that procuring agencies, when purchasing these items made from solid plastic, purchase them made with recovered plastics when these items meet applicable specifications and performance requirements.

For EPA’s recommendations for purchasing pressboard binders and paper file folders containing recovered materials, see table A-1c in the Paper Products RMAN (61 FR 26986, May 29, 1996). See Table G-3 in RMAN I for EPA’s recommendations for purchasing plastic-covered binders containing recovered materials.

Specifications: EPA did not identify any specifications for solid plastic binders, clipboards, file folders, clip portfolios, and presentation folders. EPA recommends that procuring agencies ensure that there is no language in their specifications for these items that would preclude or discourage the use of products containing recovered materials.

Section G-9. Office Furniture Containing Recovered Steel, Aluminum, Wood, Agricultural Fiber, and Plastic

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table G-9, procuring agencies establish minimum content standards for use in purchasing office furniture with recovered materials, including remanufactured or refurbished office furniture.

Table G-9. -- Recommended Recovered Materials Content Levels for Office Furniture

Product	Material	Postconsumer content (%)	Total recovered materials content (%)
Furniture structure	Steel	16	25 - 30
Furniture structure	Aluminum	—	75 - 100
Particleboard/ Fiberboard component	Wood or wood composite	Greater than 0	80 - 100
	Agricultural fiber	—	100
Fabric	PET	100	100
Plastic furniture component	HDPE	70 - 75	95
Remanufactured or Refurbished Furniture	Various	25 - 75	25 - 75

Notes: The recommended recovered materials content levels for steel in this table reflect the fact that the designated item is generally made from steel manufactured in a Basic Oxygen Furnace (BOF). Steel from the BOF process contains 25% - 30% total recovered steel, of which, 16% is postconsumer steel.

Particleboard and fiberboard used in the wood components of office furniture may also contain other recovered cellulosic materials, including, but not limited to, paper, wheat straw, and bagasse. The percentages of these materials contained in the product would also count toward the recovered materials content level of the item. In addition, while EPA has no evidence or indication that wood treated with chromated copper arsenate (CCA) is currently used in office furniture, EPA is not recommending the use of CCA-treated wood as a recovered material in office furniture. The arsenic in CCA is a known human carcinogen and EPA is currently conducting a thorough and comprehensive risk assessment of CCA as a part of the pesticide reregistration process for CCA. In addition, EPA is conducting a risk assessment for children who contact CCA-treated wood playsets and decks.

Specifications: EPA did not identify any standards or specifications that would preclude government agencies from purchasing office furniture with recovered materials content or remanufactured or refurbished office furniture. GSA requires that remanufactured furniture meet the same Underwriters Laboratories, ASTM, and Business and Institutional Furniture Manufacturer's Association standards and fire codes (Boston and California) as new furniture.

Part H - Miscellaneous Products

Part H-1 -- Pallets Containing Recovered Wood, Plastic, or Paperboard

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-1, procuring agencies establish minimum content standards for use in purchasing pallets.

Table H-1. -- Recommended Recovered Materials Content Levels for Pallets Containing Recovered Wood, Plastic, or Paperboard

Product	Material	Postconsumer content (%)
Wooden pallets	Wood	95-100
Plastic pallets	Plastic	100
Plastic lumber	Plastic	25-50
Thermoformed	Plastic	
Paperboard pallets	Paperboard	50

Note: EPA's recommendation does not preclude a procuring agency from purchasing pallets manufactured from another material. It simply requires that a procuring agency, when purchasing pallets made from wood, plastic, or paperboard, purchase these items made with recovered materials when these items meet applicable specifications and performance requirements.

Specifications: EPA recommends that procuring agencies use the following specifications when procuring pallets:

- (1) The Grocery Manufacturers of America issued a widely used standard for 48 by 40-inch stringer pallets known as the "GMA spec." A copy of this specification is available from the RCRA Hotline at 1-800-424-9346.
- (2) The National Wooden Pallet and Container Association is developing a standard through the American National Standards Institute (ANSI) for repairable 48 by 40-inch lumber-deck pallets. Contact NWPCA at (703) 527-7667 for current information about the availability of this standard.
- (3) U.S. Postal Service specification USPS-P-1108, "Pallet, Nestable, Plastic, Thermoformed (Item No. 3919B)" is for thermoformed HDPE pallets. A copy of the current version, USPS-P-1108E, is available from the RCRA Hotline at 1-800-424-9346.

Section H-2. Sorbents

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-2a, procuring agencies establish minimum content standards for use in purchasing sorbent materials for use in oil and solvent clean-ups and for use as animal bedding.

Table H-2a. -- Recommended Recovered Materials Content Levels for Sorbents Used in Oil and Solvents Clean-ups and for Use as Animal Bedding

Material	Postconsumer Content (%)	Total Recovered Materials Content (%)
Paper	90 - 100	100
Textiles	95 - 100	95 - 100
Plastics	--	25 - 100
Wood	--	100
Other Organics/Multi-Materials	--	100

Notes: "Wood" includes materials such as sawdust and lumber mill trimmings. Examples of "other organics" include, but are not limited to, peanut hulls and corn stover. An example of "multi-material" sorbents would include, but not be limited to, a polymer and cellulose fiber combination.

EPA's recommendations do not preclude a procuring agency from purchasing sorbents made from other materials. They simply require that procuring agencies, when purchasing sorbents made from paper, wood, textiles, plastics, or other organic materials, purchase them made with recovered materials when these items meet applicable specifications and performance requirements.

Specifications: EPA recommends that procuring agencies ensure that there is no language in their specifications for sorbents that would preclude or discourage the use of products containing recovered materials.

EPA recommends that procuring agencies use the ASTM specifications in Table H-2b when procuring sorbents for use on oil and solvent clean-ups.

Table H-2b. -- ASTM Specifications for Absorbents and Adsorbents

ASTM Specification Number	Title
F 716-81	Standard Method of Testing Sorbent Performance of Adsorbents
F 716-82	Standard Method of Testing Sorbent Performance of Absorbents

Section H-3. Industrial Drums Containing Recovered Steel, Plastic, and Paper

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-3, procuring agencies establish minimum content standards for use in purchasing steel, plastic, or fiber industrial drums containing recovered materials. EPA further recommends that procuring agencies reuse drums, purchase or use reconditioned drums, or procure drum reconditioning services, whenever feasible.

Table H-3. -- Recommended Recovered Materials Content Levels for Steel, Plastic, and Fiber Industrial Drums

Product	Material	Postconsumer content (%)	Total recovered materials content (%)
Steel drums	Steel	16	25-30
Plastic drums	HDPE	30-100	30-100
Fiber drums	Paper	100	100

Notes: EPA's recommendation does not preclude a procuring agency from purchasing another type of industrial drum. It simply requires that procuring agencies, when purchasing steel, plastic, or fiber industrial drums, purchase these items made with recovered materials when these items meet applicable specifications and performance requirements.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items are made from steel manufactured in a Basic Oxygen Furnace (BOF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel.

Specifications: EPA is not aware of specifications unique to industrial drums containing recovered materials. EPA notes that industrial drums containing recovered materials can meet applicable U.S. Department of Transportation specifications for packaging hazardous materials. Additionally, the National Motor Freight Traffic Association specifications for containers used to transport goods via truck do not prohibit the use of industrial drums containing recovered materials.

Section H-4. Awards and Plaques

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-4, procuring agencies establish minimum content standards for use in purchasing awards and plaques containing recovered materials.

Table H-4. -- Recommended Recovered Materials Content Levels for Awards and Plaques Containing Recovered Materials

Material	Postconsumer Content (%)	Total Recovered Materials Content (%)
Glass	75 - 100	100
Wood	--	100
Paper	40 - 100	40 - 100
Plastic and Plastic/Wood Composite	50 - 100	95 - 100

Note: EPA's recommendations do not preclude a procuring agency from purchasing awards or plaques made from other materials. They simply require that procuring agencies, when purchasing awards or plaques made from paper, wood, glass, or plastics/plastic composites, purchase them made with recovered materials when these items meet applicable specifications and performance requirements.

Specifications: EPA is not aware of specifications or standards for awards or plaques containing recovered materials. EPA recommends that procuring agencies ensure that there is no language in their specifications for awards and plaques that would preclude or discourage the use of products containing recovered materials.

Section H-5. Mats

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-5, procuring agencies establish minimum content standards for use in purchasing mats containing recovered materials.

Table H-5. -- Recommended Recovered Materials Content Levels for Mats

Material	Postconsumer Content (%)	Total Recovered Materials Content (%)
Rubber	75 - 100	85 - 100
Plastic	10 - 100	100
Rubber/Plastic Composite	100	100

Note: EPA's recommendations do not preclude a procuring agency from purchasing mats made from other materials. They simply require that procuring agencies, when purchasing mats made from rubber and/or plastic, purchase them made with recovered materials when these items meet applicable specifications and performance requirements. When purchasing mats with steel or aluminum linkages, the Agency recommends that these linkages also contain recovered materials.

Specifications: EPA is not aware of specifications or standards for mats containing recovered materials. EPA recommends that procuring agencies ensure that there is no language in their specifications for mats that would preclude or discourage the use of products containing recovered materials. EPA is aware of one

ASTM specification for wrestling mats, but does not believe that this type of mat is purchased in appreciable quantities by procuring agencies.

Section H-6. Manual-Grade Strapping Containing Recovered Steel and Plastic

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-6a, procuring agencies establish minimum content standards for use in purchasing manual-grade strapping containing recovered materials.

Table H-6a. -- Recommended Recovered Materials Content Levels for Manual-Grade Polyester, Polypropylene, and Steel Strapping

Product	Material	Postconsumer content (%)	Total recovered materials content (%)
Polyester strapping	PET	50-85	50-85
Polypropylene strapping	PP	--	10-40
Steel strapping	Steel	16 67	25-30 100

Notes: EPA's recommendations do not preclude a procuring agency from purchasing another type of strapping, such as nylon. They simply require that procuring agencies, when purchasing polyester, polypropylene, or steel manual-grade strapping, purchase these items made with recovered materials when these items meet applicable specifications and performance requirements.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which 67% is postconsumer.

Specifications: EPA is not aware of specifications unique to strapping containing recovered materials. EPA notes that strapping containing recovered materials can meet the ASTM strapping specifications and selection guide listed in Table H-6b.

Table H-6b. -- Recommended ASTM Specifications and Guide for Strapping

ASTM Specification/Guide Number	Title
ASTM D 3953	Standard Specification for Strapping, Flat Steel and Seals
ASTM D 3950	Standard Specification for Strapping, Nonmetallic (and Joining Methods)
ASTM D 4675	Standard Guide for Selection and Use of Flat Strapping Materials

Section H-7. Signage

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-7, procuring agencies establish minimum content standards for use in purchasing plastic signs for non-road applications (e.g., building signs, trail signs) and aluminum signs for roadway or non-road applications containing recovered materials. EPA also recommends that, based on the recovered materials content levels shown in Table H-7, procuring agencies establish minimum content standards for use in purchasing sign supports and posts containing recovered plastic or steel.

Table H-7. – Recommended Recovered Materials Content Levels for Signs Containing Recovered Plastic or Aluminum and Sign Posts/Supports Containing Recovered Plastic or Steel

Item/Material	Postconsumer Content (%)	Total Recovered Materials Content (%)
Plastic signs	80 - 100	80 - 100
Aluminum signs	25	25
Plastic sign posts/supports	80 - 100	80 - 100
Steel sign posts/supports	16 67	25 - 30 100

Notes: Plastic signs and sign posts are recommended for nonroad applications only such as, but not limited to, railway signs in parks and directional/informational signs in buildings.

The recommended recovered materials content levels for steel in this table reflect the fact that the designated items can be made from steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF). Steel from the BOF process contains 25% - 30% total recovered materials, of which 16% is postconsumer steel. Steel from the EAF process contains a total of 100% recovered steel, of which 67% is postconsumer.

EPA's recommendations do not preclude a procuring agency from purchasing signs or sign posts made from other materials. They simply require that procuring agencies, when purchasing signs made from plastic or aluminum or sign posts made from plastic or steel, purchase them made with recovered materials when these items meet applicable specifications and performance requirements.

Specifications: EPA is not aware of specifications for non-road signs containing recovered materials. Standard specifications for road sign size, lettering, color, strength, and performance requirements can be found in the "Manual on Uniform Traffic Control Devices," which is published by the Federal Highway Administration. Applicable portions of this manual have been placed in the RCRA public docket for the proposed CPG/RMAN III notices.

Section H-8. Bike Racks Containing Recovered Steel or Plastic

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-8, procuring agencies establish minimum content standards for use in purchasing bike racks.

Table H-8. -- Recommended Recovered Materials Content Levels for Bike Racks

Material	Postconsumer Content (%)	Total Recovered Materials Content (%)
Steel	16	25 - 30
HDPE	100	100

Note: The recommended recovered materials content levels for steel in this table reflect the fact that the designated item is generally made from steel manufactured in a Basic Oxygen Furnace (BOF). Steel from the BOF process contains 25% - 30% total recovered steel, of which, 16% is postconsumer steel.

Specifications: EPA did not identify any industry standards or specifications that would preclude the use of recovered materials in bike racks.

Section H-9. Blasting Grit Containing Recovered Steel, Coal and Metal Slag, Bottom Ash, Glass, Plastic, Fused Alumina Oxide, and Walnut Shells

Preference Program: EPA recommends that, based on the recovered materials content levels shown in Table H-9, procuring agencies establish minimum content standards for use in purchasing blasting grit containing recovered materials.

Table H-9. -- Recommended Recovered Materials Content Levels for Blasting Grit

Material	Postconsumer content (%)	Total recovered materials content (%)
Steel	16 - 67	25 - 100
Coal Slag	—	100
Copper and Nickel Slag	—	100
Bottom Ash	—	100
Glass	100	100
Glass/Plastic	20	100
Fused Alumina Oxide	100	100
Walnut Shells	—	100

Note: The recommended recovered materials content levels for steel in this table reflect the fact that the designated item may contain steel manufactured in either a Basic Oxygen Furnace (BOF) or an Electric Arc Furnace (EAF), or a combination of both. Steel from the BOF process contains 25% - 30% total recovered steel, of which 16% is postconsumer. Steel from the EAF process contains 100% total recovered steel, of which 67% is postconsumer. According to industry sources, blasting grit containing a combination of BOF and EAF steel would contain 25% - 85% total recovered steel, of which 16% - 67% would be postconsumer. Since there is no way of knowing which type of steel was used in the manufacture of the item, the postconsumer and total recovered material content ranges in this table encompass the whole range of possibilities, i.e., the use of EAF steel only, BOF steel only, or a combination of the two.

Specifications: EPA did not find any specifications that would preclude the use of recovered materials in blasting grit. EPA recommends that procuring agencies exercise OSHA or other required standard safety practices when using blasting grit, particularly when using blasting grit containing slag materials.